FEV CONSULTING: ICE CONCEPTS BEYOND 2025

BENCHMARKING FOR COMPETING TECHNOLOGY STRATEGIES

POWERTRAIN STRATEGIES FOR CO_2 EMISSION REDUCTION

The continuous tightening in the regulations and the resulting CO_2 emission targets represent a particular challenge for automobile manufacturers in the 2025 timeframe and beyond. While addressing these challenges, carmakers will still need to find cost-efficient technical approaches that don't compromise customer expectations. In overcoming this trade-off, it is useful to identify the promising concepts and then analyze their relative sensitivity to changing boundary conditions. Typically, more than one "optimum" solution exists. FEV Consulting has developed a comprehensive, structured toolkit to analyze competing technology strategies in terms of CO_2 savings potential and cost effects.

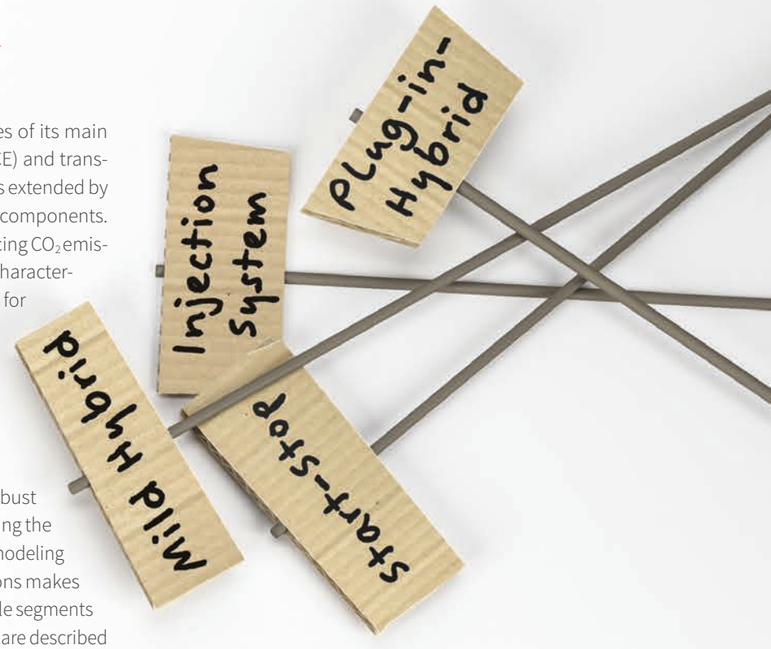
INFO

Benefits for your Business

- Objective analysis of competing powertrain concepts
- Powertrain concept impact on vehicle fleet CO_2 emission
- Analysis of carmaker-specific CO_2 emission-reduction strategies
- Identification of the most cost-efficient pathways

Powertrain Technology Strategy – Finding the Optimum Solution

The powertrain is characterized by the attributes of its main components, the internal combustion engine (ICE) and transmission. With hybridization concepts, this scope is extended by the powertrain topology and additional electrical components. Powertrain efficiency is the primary factor influencing CO_2 emissions, along with the driver behavior and vehicle characteristics. This suggests the existence of multiple paths for compliance with tightened CO_2 emission targets. "Identifying the most advantageous path highly depends on the carmaker's existing technology portfolio and competencies," explains Dr. Michael Wittler, Manager at FEV Consulting.



FEV Consulting uses an approach that leads to robust powertrain and electrification strategies, considering the individual and regional boundary conditions. The modeling of manufacturer-specific vehicle fleet CO_2 emissions makes possible the identification of target values for vehicle segments and drive types. The resulting technology packages are described in detail and assessed with respect to their benefit in terms of the CO_2 reduction vs. additional cost trade-off.

» A COMPREHENSIVE METHOD TO ESTIMATE AND MODEL CARMAKERS' SPECIFIC FUTURE STRATEGIES TO ACHIEVE THEIR INDIVIDUAL TARGETS UNTIL 2025

An integrated approach is applied for the evaluation of ICE technologies, transmissions and vehicles. Expert knowledge is leveraged within an automated and intuitive procedural approach. New technologies are continually implemented and evaluated. The results of this process support identification of the most beneficial automaker-specific technology configurations. In addition, this method allows analysis and comparison of technology trends and helps to find answers to challenging questions. For example, will downsizing be the right approach if the EU implements the WLTP as the standard drive cycle, replacing the NEDC?

CO_2 Emission Fleet Strategy – Understanding the Industry Dynamics

FEV Consulting has developed a comprehensive method for estimating and modelling OEM-specific future strategies to support achieving their individual targets by 2025. The vehicle segment portfolios for each automaker are described on the basis of the type of powertrain, considering the specific type of fuel (e.g., gasoline, diesel), the type of hybridization (e.g., mild hybrid, plug-in hybrid), or the vehicle's market share in that segment in the case of pure electric vehicles. Based on the latest registration data, the future vehicle segment portfolio and powertrain type distribution are forecast for each auto-maker. Improvements in efficiency are applied to the powertrain types in each specific segment, including the transmission. The improvements gained by vehicle measures are also considered. The results take all regionally-specific legislation into account, e.g., for counting super credits or eco innovations. "Finally, various scenarios can be simulated and the resulting strategy analysis identifies how efficiency technologies can best be leveraged with regard to the targeted achievements," concludes Dr. Wittler.

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